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EXAMINER

CHUNG, JI YONG DAVID

ART UNIT	PAPER NUMBER
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2143

DATE MAILED: 08/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/990,916

Applicant(s)

FEUERSTRAETER ET AL.

Examiner

Ji-Yong D. Chung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 21 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Response to Remarks

1. Applicant's arguments and amendments filed on April 21, 2005 have been carefully considered but they are not deemed fully persuasive. The discussion of Applicant's arguments follows.

With regard to the original rejections under 35 U. S. C. 102, Applicant has amended claim 1 to include substantially some of the limitations of original claim 9. Applicant's fundamental arguments, as applied to new claim 1, in summary are twofold: (1) a number of limitations of the original claim 1 have not been fully shown to read on the prior art cited in the first Office Action; and (2) having incorporated a number of limitations of claim 9 and "assigning ... device" limitation, amended claim 1 no longer reads on cited references.

The Office is not quite persuaded. Therefore, substance of the original ground of rejection is maintained. Note that, in the instant Office Action, the original ground of rejections under 35 U. S. C. 102 have been reconstructed under 35 U. S. C. 103, due to the rearrangement of the limitations in accordance with the Amendment.

In the interest of advancing the prosecution, the substantive grounds of rejection of original claims 1 and 9 are elaborated in the discussion of amended claims 1 in the sections that follow.

The discussion on additional limitation of claim 16 is similar to that for claim 1.

With regard to other rejections and the rejections under 35 U. S. C. 103 in the First Office Action, Applicant's argument is that the dependent claims are now allowable because the amended claim 1 is now allowable. The Office's response to Applicant is that the independent

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claims do not quite cure the perceived defects pointed to in the first Office Action, as put forth in the following discussions.

Allowable Subject Matter

2. **Claims 13 and 15**, if combined into a single claim, would be allowable.

The reason for allowability is that the prior art neither anticipates nor renders obvious the use of ten 1 Gb/s MAC devices (see claim 3) together with 4 of 10 Gb (XAUI) channels, in which the information from two of 1 Gb/s MACS are routed through the XAUI channels for supporting virtual channels.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. **Claims 1, 2, and 16** are rejected under 35 U.S.C. 102(e) as being unpatentable over Feuerstraeter et al (Pub. No. 2003/0058894, F'894 hereinafter), in view of "Comparison of Rate Control Methods," by Howard Frazier of Cisco (Frazier, hereafter), presented at IEEE 802.3ae 10Gb/s Task Force May 2000 Interim Meeting.

With regard to **claim 1**, F'894 discloses the steps comprising:

identifying a communication capability of a remote device [See paragraph 0063 and 0064, indicating that the remote communication capability is detected];

dynamically generating a virtual data sub-channel within a physical Ethernet data channel over a communication link between a communication interface and the remote device,
[The virtual “sub-channel” is created when the rates of the interfaces are matched; otherwise, there is no communication channel. As shown in Fig. 3, the communication is made through the interface. As shown in Fig. 1, the communication is made between two parties (i.e., a remote devices), at least one having the interface shown in Fig. 3. The creation is dynamic, in the sense that the channel is created on the fly, depending on what data rate is detected. See paragraph 0040, which indicates that communication is made over the Ethernet]

wherein a data rate of the virtual channel is selected based, at least in part, on the identified communication capability of the remote device [The establishment of a channel is dynamic is based on whether the remote device is in WAN or LAN mode. See paragraph 0063].

F’894 does not show, but Frazier shows:

parsing the physical channel into a plurality of timeslots based, at least in part, on the identified communication capability of the remote device [See page 9, where Frazier describes 802.3 based frame rate control. 802.3x flow control compliant devices have MACS insert IDLE frames. That is, it takes (“parses”) a channel into series of frames (“plurality of timeslots”)). Note that the latter part of this limitations is satisfied already by the earlier limitation of claim 1 (selection of WAN or LAN, that is)];

assigning a communication session to one or more of the time slots denoted by address information associated with at least the remote device..

See page 9, where Frazier describes 802.3x based frame rate control. The creation of frames (“one or more time slots”) forms a “communication session.” By the definition of 802.3x, frames carry address information associated with the remote device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use further rate control as described in Frazier with F’894’s system, because the different payload rates for WAN/PHY and UniPHY require the pacing mechanisms to establish compatibility, as explained on page 3 of Frazier titled “Why Do we Need Rate Control.”

With respect to **claim 2**, F’894 teaches:

wherein the communication link is an 802.3ae compliant communication link, with a data channel of 10Gb/s [see paragraph 0033, which indicates the disclosure applies to 802.3ae compliant devices. 802.3ae is about 10Gb/s].

Claim 16 is software version of a claim whose limitations are broader than those in claims 1 and therefore, the reasons for the rejection of claim 1 applies to claim 16. Claim 16 is rejected for the same reasons as claim 9.

5. **Claims 3-12, 17-19, and 21-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over F’894 and Frazier, and further in view of Feuerstraeter (Pat. No. 6,169,729, F’729 hereinafter).

With regard to **claim 3**, neither F’894 nor Frazier shows its limitations.

F'729 discloses identifying a communication capability of the remote device, comprising:
sending a capability request [see from line 51, column 11 to line 7, column 14]; and
receiving a response to the request denoting at least the communication capability of the remote device [see from line 51, column 11 to line 7, column 14. Also see Fig. 4]. There is an exchange of information about the transmission and reception capabilities.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine F'729's auto-negotiation feature with F'894, because the auto-negotiation would allow the adjustment of the transmission and reception rate of the interface to below its maximum, if the remote device cannot communicate as rapidly as the local one.

Note that F'894's method for identifying the ability of remote device needs to be included in the combination in addition to F'729's auto-negotiation step, because 802.3ae does not support auto-negotiation.

With regard to **claim 4**, F'729 discloses identifying a communication capability of the remote device, comprising:

receiving an indication from the remote device denoting at least the communication capability of the remote device [see auto-negotiation, lines 51-65, column 11].

With regard to **claim 5**, F'729 teaches "the indication" that also denotes a *processing capability of the remote device*. The Next Page processing capability of F'729 is *the processing capability of the remote device* (see from line 66, column 12 to line 14, column 13)].

With regard to **claim 6**, F'729 teaches *that the communication capability of the remote device is obtained by the communication interface through a negotiation process*. [see auto-negotiation, from lines 51-65, column 11].

With regard to **claim 7**, it depends on claim 1. See the above paragraph 7, for how F'894 teaches the limitations of claim 1.

F'894 teaches part of claim 7's limitations, how a link maybe established *based on the identified communication capability of the remote device*. F'894's subject matter is directed to tapping communication line at signal level to determine the communication speed of remote devices and to adjust his device's communication rate. F'894 does not teach the step of *establishing a sub-10Gb/s virtual data channel* within a physical 10Gb/s data channels. F'894's application speaks of a 10Gb channel and a sub 10 Gb channel.

What is missing from the F'894, then, is a step for adjusting speed of one's communication device such that it transmits and receives below its capacity. F'729 teaches the missing step. F'729 teaches an auto-negotiation feature/step. Auto-negotiation feature/step allows devices to communicate at the highest available rate of a device below its maximum capacity.

With regard to **claim 8**, F'894 teaches:

identifying a processing capability of the remote device by the communication interface; and modifying a virtual channel data rate based, at least in part, on the identified processing

capability of the remote device. [See paragraphs 0037-0043. In F'894, the data rate is selected for either WAN or LAN.

With regard to **claim 9**, neither F'894 nor F'729 teaches its limitations. However Frazier discloses the limitations of claim 9:

assigning one or more of the plurality of timeslots to carry substantive content, while remaining timeslots do not carry substantive content.

See page 9, where Frazier describes 802.3x based frame rate control. 802.3x flow control compliant devices have MACS to insert IDLE frames (“remaining time slots do not carry substantive content”). IDLE frames do not carry information (“substantive content.”) The rest of the frames carry real information (“plurality of generated timeslots to carry substantive content”). All this would occur in the virtual channel. The devices determines when to insert the IDLE frame; that is it “assigns” the time slots to carry substantive and non-substantive content.

With regard to **claim 10**, none of the references explicitly discloses that *substantive content is content associated with a communication session between the communication interface and the remote device.* However, note that any “substantive content” in network traffic involves at least two devices, with one transmitting substantive content to the other. It cannot be otherwise.

With regard to **claim 11**, none of the references explicitly discloses that parsing the physical channel comprises: *determining a fraction of the physical channel required to support the virtual channel*; and *parsing the physical channel into a number of timeslots, each timeslot corresponding to the fraction*. The steps are merely an application of 802.3x. Any implementation of 802.3x must calculate the number of IDLE frames (“timeslices”) per second and thus “determine a fraction.” One cannot dispense with the calculation.

With regard to **claim 12**, none of the references explicitly discloses that *parsing the physical channel comprises: parsing the physical channel into a predetermined number of timeslots*. In any frame-based pacing, MAC controls the rate of frame transmission for the physical channel, and thus “timeslices” the physical channel into a predetermined number of timeslots.

Claims 17 and 18 are software version of claims whose limitations are broader than those in claims 7 and 8 and therefore, the reasons for the rejections of claims 7 and 8 apply to claims 17 and 18. Claims 17 and 18 are rejected for the same reasons as claims 7 and 8.

Claim 19 is a software version of claim whose limitations are broader than those in claim 9, and therefore, the reasons for the rejection of claim 9 apply to claim 19.

Claim 21 is an apparatus claim whose every limitation is broader than those of claim 9, except for the cited “control logic.” The reasons for rejecting claim 9 would apply to claim 21

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and would be rejected for the same reasons as claim 9, except that claim 21 cites a control logic for the MAC. F'729 shows a CPU bus and therefore teaches a "control logic" for the MAC. See Fig. 8. Therefore, claim 21 is rejected based on the reasons for rejecting claim 9 and also the fact that Freustraeter teaches the control logic.

Note that frames ("timeslots") and inserting IDLE frames have been discussed in above. This amounts to populating the timeslots with data only to the extent that the remote device is slower than the interface.

Claim 22 is an apparatus claim. Other than control logic and auto-negotiation, each of its limitations is broader than those of claim 9. Therefore, except that claim 22 cites a control logic for the MAC and auto-negotiation, the reasons for rejecting claim 9 would apply to claim 22. The control logic has been discussed in reference to claim 21. As for auto-negotiation, F'729 shows the feature in lines 51-65, column 11.

Therefore, claim 22 is rejected based on the reasons for rejecting claim 9 and that F'729 teaches both the control logic and auto-negotiation.

Claim 23 is an apparatus claim that depends on claim 21 and cites that "the number of timeslots is predetermined." This boils down to presetting the frame rate, which is characteristic of the pacing, described in Frazier. Therefore, the reasons for rejecting claim 21 apply to claim 23. Claim 23 is rejected for the same reasons as claim 21.

Claim 24 is an apparatus claim that depends on claim 21 and cites “the MAC derives the number of timeslots required from the identified communication capability of the remote device.” The limitation has been discussed above with reference to claim 1, where Frazier shows a MAC inserting the timeslots. See page 9 of Frazier. In 802.3x supporting devices, MACs compute the number of IDLE timeslots that need to be inserted. Therefore, the reasons for rejecting claim 21 apply to claim 24. Claim 24 is rejected for the same reasons as claim 21.

Claim 25 is an apparatus claim that depends on claim 21 and cites that “the MAC is a 10Gb/s MAC.” Frazier’s MAC is 10Gb/s MAC. See the discussion of claim 9 above. Claim 25 is rejected for the same reason as claim 21 is rejected and, in addition, the fact that Frazier’s MAC is 10 Gb/s MAC.

6. **Claims 13-15, 20, and 26-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over F’894 and F’729, and further in view of Hvostov et al. (Hvostov hereafter), “802.3ae 5 Criteria” (which was referenced by “Chair’s Introductory Remarks” at IEEE 802.3 10Gb/s Task Force July 2000 Plenary Week, July 11-12, 2000) and “XAUI/XGXS Proposal” presentation at IEEE 802.3 10Gb/s Task Force May 2000 Interim Meeting Plenary Week, July 11-12, 2000.

With regard to **claim 13**, F’894 and F’729 do not show *parsing the physical channel into at least ten (10) timeslots, each associated with roughly a 1 Gb/s communication rate*. Hvostov discloses in Fig. 1 multiple MACs with which to establish the virtual channel and dynamically multiplexing them. Note that Hvostov does not indicate the bandwidth of each MAC.

The motivation for incorporating Hvostov is that one of the criteria for formulating 802.3ae standard is the compatibility of 802.3ae with prior 802.3 conforming devices. Compatibility of 802.3ae to earlier 802.3 standards have been mentioned in the "802.3ae 5 Criteria", which was referenced by "Chair's Introductory Remarks" at IEEE 802.3 10Gb/s Task Force July 2000 Plenary Week, July 11-12, 2000. Hvostov provides means for setting many MACs at particular transmission and reception rate. By using many MACs, each MAC at a particular channel, would be able to provide virtual channel at a particular, desired bandwidth. Note that one needs 10 of 1 Gb/s MACs to match 10 Gb/s MAC. The number of 1 Gb MAC's flows from the selection of 1 Gb MAC itself.

The reason for the selection of the size of bandwidth of 1Gb/s and the number of MACs of 1 Gb flow from further consideration of the compatibility question: what 802.3 compliant sub-10Gb/s data channel interface bandwidths are most commercially popular and would likely must co-exist (i.e., compatible) with to 802.3ae?

It would have been obvious to one skilled in the art at the time of the invention to choose 1Gb/s channels, because that is the next fastest IEEE 802.3 standard for Ethernet. If anyone were to upgrade their Ethernet interfaces, those would most likely be upgrading from bandwidths in multiple of 1Gb/s.

With regard to **claim 14**, F'894 and F'729 do not show *selecting one or more 1Gb/s MAC(s) or a 10 Gb/s MAC with which to establish the virtual channel; and dynamically multiplexing either the 1Gb/s MAC(s) or the 10Gb/s MAC to an appropriate one or more channel(s) of an attachment unit interface (AUI)*. Hvostov discloses in Fig. 1 multiple MACs

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with which to establish the virtual channel and dynamically multiplexing them. Note that Hvostov does not indicate the bandwidth of each MAC.

At this point, in order to make the prima facie argument that claim 14 should be rejected under 103(a), the Examiner must show (1) the motivation for combining the above references and (2) the reason why one would select 1Gb/s and 10 Gb/s MACs.

The motivation for combining F'894 and F'729 has been given above with regard to claim 7. The motivation for incorporating Hvostov is that one of the criteria for formulating 802.3ae standard is the compatibility of 802.3ae with prior 802.3 conforming devices. Compatibility of 802.3ae to earlier 802.3 standards have been mentioned in the "802.3ae 5 Criteria", which was referenced by "Chair's Introductory Remarks" at IEEE 802.3 10Gb/s Task Force July 2000 Plenary Week, July 11-12, 2000. Hvostov provides means for setting many MACs at particular transmission and reception rate. By using many MACs, each MAC at a particular channel, would be able to provide virtual channel at a particular, desired bandwidth.

The reason for the selection of the size of bandwidth of 1Gb/s flow from further consideration of the compatibility question: what 802.3 compliant sub-10Gb/s data channel interface bandwidths are most commercially popular and would likely must co-exist (i.e., compatible) with to 802.3ae? It would have been obvious to one skilled in the art at the time of the invention to choose 1Gb/s channels, because that is the next fastest IEEE 802.3 standard for Ethernet. If anyone were to upgrade their Ethernet interfaces, those would most likely be upgrading from bandwidths in multiple of 1Gb/s.

With regard to **claim 15**, "XAUI/XGXS Proposal" presentation at IEEE 802.3 10Gb/s Task Force May 2000 Interim Meeting Plenary Week, July 11-12, 2000 shows

at least four (4) 10Gb/s attachment unit interface (XAUI) channel(s), wherein content from up to two (2) 1Gb/s MAC(s) are selectively routed through each of the four XAUI channels such that each XAUI channel supports virtual channels of 1Gb/s resolution. See pages 7 and 15. The presentation at IEEE Meeting illustrates 16 wires, or 2 sets of 4 differential pairs to support 10 Gb/s. Therefore, each lane supports 2.5Gb/s. In order to feed the XAUI, with 1Gb/S MAC's, one would need up to two 1Gb/s MACs to be routed to each of them. Routing 3 MACs would exceed lane capacity, and routing 1 would not fully utilize it.

Claim 20 is a software version of claim whose limitations are broader than those in claims 14, and therefore, the reasons for the rejection of claim 14 apply to claim 20. Claim 20 is rejected for the same reasons as claim 14.

With regard to **claims 26-29**, each of their limitations has been discussed in reference to claims 14, 15, and 20. Note that claim 27's limitation on 2.5Gb/s channel has been addressed in the discussion of claim 15.

The reasons for the rejections of claims 14, 15, and 20 therefore apply claims 26-29. Claims 26-29 are rejected for the same reasons as claims 14, 15, and 20.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ji-Yong D. Chung whose telephone number is (571) 272-7988. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on (571) 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ji-Yong D. Chung
Patent Examiner
Art Unit: 2143


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